REMARKS

By this amendment, applicants have amended claims 1 and 8 to include therein the limitations previously recited in dependent claims 5 and 12, respectively. Claims 5 and 12 have been cancelled and the dependency of claims previously depending from claims 5 and 12 revised. Applicants have also added claims 54 - 65 to define a further aspect of the present invention. See page 16, line 7 to page 17, line 1 of applicants' specification.

Claims 1 - 3 and 8 - 10 stand rejected under 35 USC 102(b) as being anticipated by United States Patent No. 5,905,117 to Yokotsuka et al. Applicants traverse this rejection and request reconsideration thereof, at least insofar as it applies to the claims as presently amended.

The present invention relates to a composition comprising a thermal heat decomposable polymer and a siloxane oligomer dissolved in an organic solvent or to a composition comprising a thermally decomposable polymer, a siloxane oligomer and an organic solvent in which both the terminally decomposable polymer and the siloxane oligomer are soluble. The present invention also relates to a method for forming a low permittivity film using the composition, to a low permittivity film formed by the method and to an electronic part having the low permittivity film. According to the present invention, the thermally decomposable polymer is a polymer which exhibits a weight loss at 400°C of 80% or more based on the weight at 150°C as measured by thermogravimetric analysis in which the temperature is elevated from 30°C or lower at a temperature elevation rate of 20°C/min. under an air stream. See, page 5, lines 20 - 26 of applicants' specification.

The patent to Yokotsuka et al discloses a low dielectric resin composition comprising a resin having functional groups in its molecule and being soluble in a

solvent, and a partially hydrolyzed condensate of alkoxysilanes. It is disclosed that the dielectric constant of a coating film formed by the composition is at most 3. As the resin having functional groups in its molecule and being soluble in a solvent, resins (1) to (4) described from column 4, line 60 to column 5, line 3 of Yokotsuka et al are mentioned. Of them, resins (1) or (2) are disclosed to be preferred. Resins (1) and (2) are fluorine resins, resin (3) is a fluorine-containing condensed resin and resin (4) is a resin containing no fluorine, or a fluorine resin having functional groups in its molecule, other than the resins (1) to (3). There is no disclosure that the resin having functional groups in its molecule and being soluble in a solvent should be thermally decomposable. While the Examiner alleges that any resin which is organic is inherently thermally decomposable above a certain temperature in a certain atmosphere, it is noted applicants' claims call for the thermally decomposable polymer to exhibit a weight loss at 400°C of 80% or more based on the weight at 150°C as measured by a thermo gravimetric analysis in which the temperature is elevated from 30°C or lower at a temperature elevation rate of 20°C/min under an air stream. This is clearly not disclosed or suggested by Yokotsuka et al. In fact, since the Yokotsuka et al patent discloses that fluorine resins are preferred, and fluorine resins generally have a heat resistance at about 400°C, it is submitted the Yokotsuka et al patent teaches away from the presently claimed invention. Accordingly, claims 1 - 3 and 8 -10 are patentable over Yokotsuka et al.

Claims 1 - 3, 8 - 10, 15, 16, 18, 19, 21, 22, 25 - 29, 31, 34, 35, 37, 38, 40, 43 and 45 to 52 stand rejected under 35 USC 102(b) as allegedly being anticipated by Japanese Patent Application Publication No. 10-158012 (Ioka et al). Applicants traverse this rejection at least insofar as it applies to the claims as presently amended.

Ioka et al (JP-10-158-12-A) discloses a method of manufacturing a porous silicone oxide film which comprises dissolving alkoxysilane and an organic polymer having an amide bond in a solvent, hydrolyzing it partially by addition of an acid, adding a base catalyst, coating the solution on a substrate in a film state, subjecting to hydrolysis and dehydration condensation, evaporating the solvent, and removing the organic polymer from the resulting dried gel. Examples of the organic polymer having an amide bond may include poly(N-vinylpyrrolidone), poly(N-vinylcaprolactone), polyacrylamide derivative, polymethacrylamide derivative, polyoxazoline derivative, polyimide derivative, polyurethane derivative, polyurea derivative, nylon derivative and a mixture of these polymers as disclosed at paragraph 0009 thereof. However, these organic polymers are difficult to remove at a temperature of 400°C, and they are removed in the working examples at 600°C in nitrogen for 8 to 12 hours.

Therefore, it is submitted the Ioka et al document does not disclose the present invention, including a composition comprising a thermally decomposable polymer, a siloxane oligomer and an organic solvent, wherein the thermally decomposable polymer exhibits a weight loss at 400°C of 80% or more based on the weight at 150°C as measured by a thermogravimetric analysis in which the temperature is elevated from 30°C or lower at a temperature elevation rate of 20°C/min under an air stream. Accordingly, the Ioka et al document does not disclose and would not have suggested the presently claimed invention.

Claims 1 - 3, 8 - 10, 15 - 23, 26 - 29, 35 - 40, 44, 46, 47, 50, 51 and 53 stand rejected under 35 USC 102(b) as allegedly being anticipated by Japanese Patent Application Publication No. 11-217458 (Hirata-sic-Narita et al). Applicants traverse

this rejection and request reconsideration thereof, at least insofar as it applies to the claims presently in the application.

The Narita et al document discloses obtaining an insulation film having low permittivity by heat-treating a film of a uniformly compatibilized composite material of a condensate of a partial hydrolyzate of an alkoxysilane with a resin at a temperature equal to or higher than the heat decomposition temperature of the resin. The abstract of this document discloses that the resin is a fluorine-containing resin or a fluorine-free resin having a specified proportion of functional groups capable of cross-linking with component B or a coupling agent and having a relative permittivity of 3 or below. However, this document does not disclose that the resin should be a thermally decomposable polymer which exhibits a weight loss at 400°C of 80% or more based on the weight at 150°C as measured by a thermogravimetric analysis in which the temperature is elevated from 30°C or lower at a temperature elevation rate of 20°C/min under an air stream. As with Yokotsuka et al, this document discloses that the resin can be a fluorine-containing resin. Since fluorine resins generally exhibit heat resistance at about 400°C, it is submitted the Narita et al patent does not disclose and would not have suggested the presently claimed invention.

Claims 4 - 7, 11 - 14, 24, 25, 30 - 34, 41 - 43, 45, 48, 49, and 52 stand rejected under 35 USC 102(b) as allegedly being anticipated by Hirata (sic-Narita et al) as evidenced by United States Patent No. 6,150,446 to Numata. Applicants traverse this rejection and request reconsideration thereof.

In support of this rejection, it has been urged by the Examiner that Narita et al teach the use of acryl resins which are fluorine-free at paragraph 0039. The Examiner further alleges that the Numata patent teaches that the acryl resin is a methacrylate polymer or an acrylate polymer. However, the term "acryl resin" is a

general name for a polymer in which acrylic acid and/or methacrylic acid and/or acrylate and/or methacrylate is/are (co)polymerized, and a huge number of acryl resins exist having different compositions or characteristics (e.g., molecular weight, various kinds of physical and chemical properties, etc.) by changing a compositional ratio, polymerization conditions, etc. According to the present invention, from among the huge number of acryl resins, the present invention can use a specific, thermally decomposable polymer, i.e., one which exhibits a weight loss at 400°C of 80% or more based on the weight at 150°C as measured by a thermogravimetric analysis in which the temperature is elevated from 30°C or lower at a temperature elevation rate of 20°C/min under an air stream. Such is neither disclosed nor suggested by Narita et al, with or without the teachings of Numata.

Claims 1 - 3, 8 - 10, 15, 16, 18, 19, 25 - 29, 31, 34, 35, 37, 38, 40 and 43 stand rejected under 35 USC 102(b) as allegedly being anticipated by Japanese Patent Application Publication No. 05-294609 (Imai) as evidenced by United States Patent No. 5,700,844 to Hedrick et al. Applicants traverse this rejection and request reconsideration thereof.

According to the English abstract of Imai, this document discloses that a solution produced by dissolving an aromatic polyamic acid amine salt and a silicone alkoxide in an alcohol is applied to a surface of a substrate by casting or coating and the film baked at a temperature below the decomposition temperature to obtain a polyamide-silica composite film. The Examiner has cited the Hedrick et al patent only as showing that a porous silica film is a low permittivity film. However, it is submitted Imai, with or without Hedrick et al, does not disclose the present invention, including the use of a thermally decomposable polymer which exhibits a weight loss at 400°C of 80% or more based on the weight at 150°C as measured by a thermo-

gravimetric analysis in which the temperature is elevated from 30°C or lower at a temperature elevation rate of 20°C/min under an air stream.

Claims 20, 23, 44 and 53 stand rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as being over Japanese Patent Application Publication No. 10-158012 (Ioka et al). Applicants traverse this rejection and request reconsideration thereof.

The low permittivity film, and hence the electronic part having the low permittivity film presently claimed is made by a method using the composition defined in amended claim 1 or 8. By using the composition defined in the amended Claim 1 or 8, a low permittivity film having a specific permittivity of 2.5 or less can be obtained at a temperature of about 400°C, and the film can be applied to an interlayer insulating film for semiconductor devices such as LSI having finer wiring and for multilayer printed circuit boards, whereby excellent electrical properties such as low permittivity and high dielectric strength, and an improvement of performance, such as reduction of the signal-propagation delay time can be achieved as mentioned on page 16, lines 28 - 34 of applicants' specification. Moreover, since it is possible to form the film at about 400°C, it can be also applied to a process wherein Cu wiring is used as a wiring material in the electronic part. See, new claims 54 - 65. These effects are neither disclosed or suggested in Ioka et al.

Claims 18 - 23, 29, 40, 44, 46, 50 and 53 stand rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as being obvious of Hedrick et al. Applicants traverse this rejection and request reconsideration thereof.

The low permittivity film, and hence the electronic part having the low permittivity film presently claimed is made by a method using the composition defined in amended claim 1 or 8. By using the composition defined in the amended

Claim 1 or 8, a low permittivity film having a specific permittivity of 2.5 or less can be obtained at a temperature of about 400°C, and the film can be applied to an interlayer insulating film for semiconductor devices such as LSI having finer wiring and for multilayer printed circuit boards, whereby excellent electrical properties such as low permittivity and high dielectric strength, and an improvement of performance such as reduction of the signal-propagation delay time can be achieved as mentioned on page 16, lines 28 - 34 of applicants' specification. Moreover, since it is possible to form the film at about 400°C, it can be also applied to a process wherein Cu wiring is used as a wiring material in the electronic part. See, new claims 54 - 65. These effects are neither disclosed or suggested in Hedrick et al.

Claims 20 and 44 stand rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as being obvious over Imai as evidenced by Hedrick et al. Applicants traverse this rejection and request reconsideration thereof.

The low permittivity film, and hence the electronic part having the low permittivity film presently claimed is made by a method using the composition defined in amended claim 1 or 8. By using the composition defined in the amended Claim 1 or 8, a low permittivity film having a specific permittivity of 2.5 or less can be obtained at a temperature of about 400°C, and the film can be applied to an interlayer insulating film for semiconductor devices such as LSI having finer wiring and for multilayer printed circuit boards, whereby excellent electrical properties such as low permittivity and high dielectric strength, and an improvement of performance such as reduction of the signal-propagation delay time can be achieved as mentioned on page 16, lines 28 - 34 of applicants' specification. Moreover, since it is possible to form the film at about 400°C, it can be also applied to a process wherein

Cu wiring is used as a wiring material in the electronic part. See, new claims 54 - 65. These effects are neither disclosed or suggested in Imai and Hedrick et al.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 511.41485X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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